



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,355	11/03/2005	Rainer Perthold	60291.000032	8938
21967 7590 02/22/2008 HUNTON & WILLIAMS LLP INTELLECTUAL PROPERTY DEPARTMENT 1900 K STREET, N.W. SUITE 1200 WASHINGTON, DC 20006-1109				
EXAMINER				
ROSATI, BRANDON MICHAEL				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
02/22/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/526,355

Applicant(s)

PERTHOLD ET AL.

Examiner

BRANDON M. ROSATI

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 20-25 is/are rejected.
- 7) ☒ Claim(s) 7-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/003)
- Paper No(s)/Mail Date 11/3/2005
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Information Disclosure Statement***

The information disclosure statement filed December 3, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. With regards to this particular Information Disclosure Statement (IDS), an English abstract of the following foreign documents have not been provided so they cannot be considered: FR2078558A, DE9104385U, DE2416471A, DE19804904C1, DE19701100C2, DE3044135A1, DE29820993U1, DE7930973U1.

Specification

1. The disclosure is objected to because of the following informalities: The phrases "independent claim 1 to 6 or 20" (p2, line 2), "claim 7" (p2, line 3), "claim 8" (p2, line 7), "claim 16, 17" (p2, line 14), "claim 1" (p2, line 28), "claim 2" (p3, line 5), "claim 11" (p3, line 23), "claim 5" (p3, line 26), "claim 4," "claim 3" (p4, lines 1-2), "claim 20" (p4, line 22), "claim 21" (p4, line 30), "claim 21" (p4, line 33), "claim 23, claim 6," "claim 23" (p5, lines 1-2), "claims 6, 19, 18, 9, 10" (p5, line 5), "claim 12" (p5, line 7), and "claim 13, 14" (p5, line 10) of the specification should clearly recite all the structural elements regarding the claims, so as to clarify any confusion. If all the structural elements are recited, then the phrases should be removed. Appropriate correction is required.

Claim Objections

2. Claims 5 is objected to because of the following informalities: In claim 5, line 10, the word "plan" should be - - plane - -. Appropriate correction is required.
3. Claims 7-19 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim either directly or indirectly. See MPEP § 608.01(n). Accordingly, the claims 7-19 have not been further treated on the merits.
4. In claim 1, line 8, the word "a" should be changed to - -the - - in front of the phrase refrigerant air flow. Please review all of the claims for informalities and address them accordingly.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 3-5 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Bachinger (U.S. Patent No. 6,026,894).

Regarding claim 3, Bachinger discloses in Figure 2, a heat exchanger with an airflow to be cooled (i.e. heat exchanging media) (Column 3, lines 1-2) that can be supplied through an inlet (i.e. connection) (7) to a plurality of parallel first chambers, refrigerating air (i.e. heat exchanging media) can be supplied to a plurality of second parallel chamber, wherein the second chambers are parallel to the first chambers and alternate with the first in the direction of height

Art Unit: 3744

and furthermore, the alternating chambers extend in a segment of the unit which is between the inlet (7) and the end of the unit. It is noted that the phrase "for use in a server cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function.

Regarding claim 4, Bachinger discloses in Figure 2, a heat exchanger with an airflow to be cooled (i.e. heat exchanging media) (Column 3, lines 1-2) that can be supplied to an outlet area (i.e. connection) (8) through a plurality of parallel first chambers, refrigerating air (i.e. heat exchanging media) supplied to a plurality of second parallel chamber, wherein the second chambers are parallel to the first chambers and alternate with the first in the direction of height and furthermore, the alternating chambers extend in a segment of the unit which is between the outlet area (8) and the end of the unit. It is noted that the phrase "for use in a server cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function.

Deleted: being**Deleted:** supplied

Regarding claim 5, Bachinger discloses in Figure 2, a heat exchanger with flat channels progressing in parallel, wherein the channels have a length, a width, and a height that is significantly less than the width and wherein the flat channels are a size that corresponds to the entire flat side of the unit. It is noted that the phrase "for use in a server cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function.

Regarding claim 20, Bachinger discloses refrigerating air (i.e. heat exchanging media) flowing past the inlet (7) of the air to be cooled and in front of the outlet (8) of the air airflow which has been already cooled downstream. It is noted that the phrase "for use in a server

cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung (U.S. Patent No. 4,384,611) in view of Reinhard (U.S. Patent No. 4,386,651).

Regarding claim 1, Fung discloses in Figure 3, a flat refrigerating unit (i.e. heat exchanger), having heated air (H) and refrigerating air (C) flowing in a countercurrent direction (i.e., in opposite directions), without coming into contact with one another (Column 6, lines 24-28). Fung discloses the heated air (H) instead of the refrigerating air (C) flowing in an essentially straight line through the chamber, however it would be an obvious mechanical expedient to have the refrigerated air blow straight through instead of the heat air depending on which way the heat exchanger is situated within the housing, so long as the countercurrent direction of the two different air mediums is maintained. Fung does not disclose the device being used in a cabinet or a first fan positioned at the input side of the refrigerating air and a second fan on the outlet side of the refrigerant air. However, Reinhard discloses in Figure 1, a heat exchanger (1) located within an electronic cabinet with fans (4 and 8) positioned on an inlet and outlet side. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Fung with the fans and cabinet of Reinhard, because the fans would allow for more air to be streamed through the heat exchanger and thus increase the overall amount of heat transfer which would occur.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung (U.S. Patent No. 4,384,611) in view of Reinhard (U.S. Patent No. 4,386,651) in further view of Svensson et al. (WO 00/52979).

Regarding claim 2, Fung discloses in Figure 3, refrigerating air (C) only being diverted twice in essentially a right angle, from an input flow direction downward into the heat

exchanger, passing into a plurality of parallel chambers within the unit, passing through the unit in a parallel manner, and then passing out of the unit through an outlet in essentially a perpendicular manner, wherein the flow path as described is a U-shaped flow path. Fung discloses the heated air (H) instead of the refrigerating air (C) flowing in an essentially straight line through the chamber, however it would be an obvious mechanical expedient to have the heated air flow through in a U-shaped flow path instead of the refrigerated air depending on which way the heat exchanger is situated within the housing, so long as the countercurrent direction of the two different air mediums is maintained. Fung does not disclose the device being used in a cabinet or a third fan positioned at the input side of the heated air. However, Reinhard discloses in Figure 1, a heat exchanger (1) located within an electronic cabinet with fans (4 and 8) positioned on an inlet and outlet side and Svensson et al. disclose, in Figure 1 and the abstract, a third fan on the inlet of the air to be cooled. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Fung with the fans and cabinet of Reinhard and Svensson, because the overall efficiency of the heat exchanger would be increased by increasing the amount of heat exchange occurring within the unit.

12. Claims 3-5 ~~and 20-23~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Bachinger (U.S. Patent No. 6,026,894) in view of Fung (U.S. Patent No. 4,384,611).

Regarding claim 3, Bachinger discloses in Figure 2, a heat exchanger with an airflow to be cooled (i.e. heat exchanging media) (Column 3, lines 1-2) ~~can be supplied through an inlet~~ (i.e. connection) (7), to a plurality of parallel first chambers, refrigerating air (i.e. heat exchanging media) supplied to a plurality of second parallel chamber, wherein the second

Deleted: being

chambers are parallel to the first chambers and alternate with the first in the direction of height and furthermore, the alternating chambers extend in a segment of the unit which is between the inlet (7) and the end of the unit. It is noted that the phrase "for use in a server cabinet" is a statement of intended use and thus this particular heat exchanger could easily be employed to perform the same function. Bachinger does not specifically teach that the two heat exchanging media being used within the heat exchanger are air. However, Fung discloses a counter-flow heat exchanger preferably used for gaseous fluid mediums (i.e. air) (Column 1, lines 55-56). Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Bachinger with the gaseous fluid mediums of Fung because the structural features as shown in Bachinger would be capable of exchanging heat between hot and cold air as easily as between oil and water, the only difference between the two being the application in which the heat exchanger is being employed.

Regarding claim 4, Bachinger discloses in Figure 2, a heat exchanger with an airflow to be cooled (i.e. heat exchanging media) (Column 3, lines 1-2) ~~can be supplied to an outlet area~~ (i.e. connection) (8) through a plurality of parallel first chambers, refrigerating air (i.e. heat exchanging media) supplied to a plurality of second parallel chamber, wherein the second chambers are parallel to the first chambers and alternate with the first in the direction of height and furthermore, the alternating chambers extend in a segment of the unit which is between the outlet area (8) and the end of the unit. It is noted that the phrase "for use in a server cabinet" is a statement of intended use and thus this particular heat exchanger could easily be employed to perform the same function. However, Fung discloses a counter-flow heat exchanger preferably used for gaseous fluid mediums (i.e. air) (Column 1, lines 55-56). It is further noted that

Deleted: being

although the flow through Bachinger is not countercurrent, it would be an obvious mechanical expedient to employ the counter-flow as shown in Fung to allow for more heat exchange to occur between the passing media. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Bachinger with the gaseous fluid mediums of Fung because the structural features as shown in Bachinger would be capable of exchanging heat between hot and cold air as easily as between oil and water, the only difference between the two being the application in which the heat exchanger is being employed.

Regarding claim 5, Bachinger discloses in Figure 2, a heat exchanger with flat channels progressing in parallel, wherein the channels have a length, a width, and a height that is significantly less than the width and wherein the flat channels are a size that corresponds to the entire flat side of the unit. It is noted that the phrase "for use in a server cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function. However, Fung discloses a counter-flow heat exchanger preferably used for gaseous fluid mediums (i.e. air) (Column 1, lines 55-56). It is further noted that although the flow through Bachinger is not countercurrent, it would be an obvious mechanical expedient to employ the counter-flow as shown in Fung to allow for more heat exchange to occur between the passing media. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Bachinger with the gaseous fluid mediums of Fung because the structural features as shown in Bachinger would be capable of exchanging heat between hot and cold air as easily as between oil and water, the only difference between the two being the application in which the heat exchanger is being employed.

Regarding claim 20, Bachinger discloses refrigerating air (i.e. heat exchanging media) flowing past the inlet (7) of the air to be cooled and in front of the outlet (8) of the air airflow which has been already cooled downstream. It is noted that the phrase "for use in a server cabinet" and "in a countercurrent" are statements of intended use and thus this particular heat exchanger could easily be employed to perform the same function. It is also noted that when the heat exchanger is in operation, the method step would be performed. However, Fung discloses a counter-flow heat exchanger preferably used for gaseous fluid mediums (i.e. air) (Column 1, lines 55-56). It is further noted that although the flow through Bachinger is not countercurrent, it would be an obvious mechanical expedient to employ the counter-flow as shown in Fung to allow for more heat exchange to occur between the passing media. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Bachinger with the gaseous fluid mediums of Fung because the structural features as shown in Bachinger would be capable of exchanging heat between hot and cold air as easily as between oil and water, the only difference between the two being the application in which the heat exchanger is being employed.

Regarding claim 21, Bachinger discloses a flow past the inlet (7) which is greater than the width of the inlet (7). It is noted that when the heat exchanger is in operation, the method step would be performed.

Regarding claim 22, Bachinger discloses air to be cooled and refrigerating air flowing in two dimensionally extended layers. It is obvious to one of ordinary skill that the height is sufficient to encourage turbulent flow. It is noted that when the heat exchanger is in operation, the method step would be performed.

Regarding claim 23, Bachinger discloses the claimed invention with the exception of specific dimensions for the height of the layers. It would have been obvious to one with ordinary skill in the art at the time the invention was made to utilize less than 10 mm for the height of the layers since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bachinger (U.S. Patent No. 6,026,894) in view of Fung (U.S. Patent No. 4,384,611) in further view of Pavlin (U.S. Patent No. 5,810,071).

Regarding claim 6, the combined teachings of Bachinger and Fung disclose all the claimed limitations except sealing separating elements for the air to be cooled provided in the inflow and outflow area that can be completely flushed by the air flow of the refrigerating air and air to be cooled. It is noted that the phrase "for use in a server cabinet" is a statement of intended use and thus this particular heat exchanger could easily be employed to perform the same function. However, Pavlin discloses in Figure 1, sealing separating elements (i.e. sealing rings) (19) at the inflow and outflow area (Column 2, lines 35-39). It is further noted that although the flow through Bachinger is not countercurrent, it would be an obvious mechanical expedient to employ the counter-flow as shown in Fung to allow for more heat exchange to occur between the passing media. Hence it would have been obvious to one of ordinary skill in the art, at the time

the invention was made to modify the combined teachings of Bachinger and Fung with the sealing separating elements of Pavlin because using the sealing separating elements instead of deep drawn projections (4) (Figure 2 and column 2, lines 59-67) would allow for a better seal, which would increase and improve the overall efficiency of the heat exchanger.

14. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bachinger (U.S. Patent No. 6,026,894) in view of Fung (U.S. Patent No. 4,384,611) in further view of Reinhard (U.S. Patent No. 4,386,651) and Svensson et al. (WO 00/52979)..

Regarding claim 24, the combined teachings of Bachinger and Fung disclose all the claimed limitations except a third and fourth fan. However, Reinhard discloses in Figure 1, a heat exchanger (1) located within an electronic cabinet with fans (4 and 8) positioned on an inlet and outlet side and Svensson et al. disclose in Figure 1 and the abstract, a third and fourth fan positioned on an inlet and outlet. It is noted that although the fans of Reinhard are positioned at the inlet and outlet of the second air medium, it would be an obvious mechanical expedient to place fans at the inlet and outlet of the heated air to allow for more heated air to be streamed through the heat exchanger. Hence it would have been obvious to one of ordinary skill in the art, at the time the invention was made to modify the teaching of Fung with the fans and cabinet of Reinhard and the fans of Svensson et al., because the overall efficiency of the heat exchanger would be increased by increasing the amount of heat exchange occurring within the unit. It is noted that when the heat exchanger is in operation, the method step would be performed.

Regarding claim 25, it would be obvious to employ the method of claim 20 into any of the heat exchangers found in claims 1-6 because when the heat exchangers are in operation the method step would be performed.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Foust (U.S. Patent No 4,276,927) discusses seal gaskets.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRANDON M. ROSATI whose telephone number is (571) 270-3536. The examiner can normally be reached on Monday-Friday 8:00am- 4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler or Frantz Jules can be reached on (571) 272-4834 or (571) 272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BMR
2/14/2008

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744